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ABSTRACT

This paper discusses how to incorporate the science, technology, and society (STS) strand of social studies into the elementary education curriculum. The lesson's focus is on the impact of modern transportation, specifically the automobile, on the economic, social, and political life of people in Kano, Nigeria. The lesson is appropriate for fourth- to fifth-grade levels. The lesson emphasizes helping children understand the impact of science and technology on human societies across time and space. Fact sheets are provided on Nigeria with instructions for students to gather further data and analyze materials presented. A brief story of an 11-year-old Nigerian is included with details on how a new automobile affected the lives of the family. (EH)

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Facilitating Children's Understanding of Technology as Agents for Social Change: The Impact of the Automobile on Kano, Nigeria.

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Presented at the Annual Meeting of the National Council for the Social Studies (NCSS), Cincinnati, OH, November 20-23, 1997.

Introduction

Science, Technology, and Society (STS) is one of the ten themes in the Social Studies Curriculum Standards (NCSS, 1994). It is a significant component of the social studies curriculum at all levels. The relationship between the three areas is important for young children to understand so that they can appreciate the impact of science and technology on their daily lives. This lesson, therefore, is an example of how to incorporate the STS theme into the elementary social studies curriculum. It focuses on the impact of modern transportation, specifically the automobile, on the economic, social, and political life of people in Kano, Nigeria. The lesson is appropriate for fourth to fifth grade levels. The emphasis is on helping children understand the impact of science and technology on human societies across time and space. In this regard, the Global Connections and People, Places, and Environments themes of the Social Studies Curriculum Standards is integrated with the STS theme.

Kano, Nigeria

Kano is one of the 36 states in the Federal Republic of Nigeria, a West African nation of about 120 million people. The city of Kano has a long history as a center of commerce, politics, and learning dating back several centuries. Due to the cosmopolitan nature of the city, many technological innovations have been introduced first in Kano that later on spread to other parts of the region and the country as a whole.

Kano has been a commercial center for centuries. It has served as a hub for the trans-Saharan trade that connected North Africa, West Africa, and Eastern Africa. Before the introduction of the modern means of transportation, people used animals and human porters to move people, goods, and services from one place to another. Merchants rode on camels, horses, and donkeys on the long and arduous journey across the Sahara to transport their wares. The introduction of modern transportation such as the automobile, railway, and airplanes changed the lives of people in Kano dramatically. Even though the traditional life of *Kanawa* (Kano people) is still preserved, modern technology has brought about changes in their lifestyle, culture, economy, politics, and social relations. For one, the focus of trade has shifted from the ancient trans-Saharan trade routes toward the western coast of the Atlantic. The railway system, road networks, and air routes established by the British colonial administration partly accounted for this shift. Communication has improved, and the movement of people, goods, and services is more efficient. This lesson will help students understand how technology brings about change in society.

Title: How has the car changed people's lives in Kano, Nigeria?

Grade level: Fifth

Rationale: This lesson is an example of strategies for implementing the themes of the Social Studies Curriculum Standards. The STS theme is one of the least emphasized in the elementary classroom. This lesson is an example of how science and social studies can be integrated to facilitate powerful and meaningful learning for students as they are able to construct understandings and meanings of the interconnectedness of science, technology, and society. This is consistent with the definition of social studies as a subject that derives its goals and content from a variety of disciplines including the social and natural sciences.

The lesson also incorporates the Global Connections theme of the Social Studies Curriculum Standards as it teaches about the impact of science and technology on another country. Students will be able to expand their global perspectives by learning about other countries. It is important for American children to learn about other cultures and societies so they can understand the interconnections between different peoples and cultures in an interdependent world. They will be able to compare and contrast the role of technology in different societies as well as the concept of change, i.e. how technology has changed people's lives across time and space. Students will be able to analyze this concept in the context of their own society and other societies. This facilitates critical thinking.

The theme of People, Places, and Environments is also incorporated into the lesson. Students will learn about the peoples, geography, and resources of Nigeria, and how people adapt to change.

Objectives:

1) Students will locate Nigeria and Kano on a map of Africa, a world map, or a globe.
2) Students will read the **NIGERIA: A FACT SHEET** handout to get an overview of the country of Nigeria and view a film showing various aspects of life in Nigeria.
3) Students will brainstorm about the kinds of transportation available and used in Kano, Nigeria.
4) Students will compare and contrast the impact of the car on their lives and the lives of people in Kano, Nigeria.
5) Students will make generalizations about the impact of automobile on society.

Procedures:

Have students individually and in small groups, locate Kano, Nigeria on a globe, a map of Africa, or a world map. How big or small is Nigeria compared to the United States (or the students' home state)? How many people do you think live in Nigeria?
Tell students that in this lesson, they are going to study the impact of the car on the society of Kano in Northern Nigeria.

Students will read the **NIGERIA: A FACT SHEET** handout to get an overview of the country of Nigeria. Students will answer the following questions to come up with possible hypotheses or generalizations that they can examine:

> What kinds of transportation do people use in Nigeria? Are they the same or different from the kinds of transportation that we use in the United States? Why are they similar or different? Are modern means of transportation better than traditional means of transportation? Why or why not?

Students' responses will be written on the chalkboard.

Show a film on Nigeria, showing various aspects of the country such as places (cities, towns, villages, etc.), transportation, factories, schools, children, etc. Have students take notes while they are watching the film. After watching the film, students will in small groups of three analyze their observations as they relate to their responses to the questions above. They will check their responses to see if they are accurate based on what they saw in the film. Have students write down the main points of their discussion on a poster that will be posted on the wall. After the small group discussions, the groups will report to the whole class. Class discussion follows.

Provide an overview of the city of Kano, Nigeria (see handout - **KABIRU'S FAMILY**).

Have students in small groups, discuss how the car has changed people's lives in the local community.

Based on the handout **KABIRU'S FAMILY**, have students discuss how the car has changed the lives of people in Kano, Nigeria.

Students will then compare similar and different ways the car has changed their community and the people of Kano and summarize the information on a chart.

Assessment: Students will write an essay on the impact of technology on society, focusing on their local community and the city of Kano, Nigeria.

Materials: Globe, world map or a map of Africa; handout - **NIGERIA: A FACT SHEET**; handout - **KABIRU'S FAMILY**; poster papers, small post-its for identifying location of countries on maps.

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NIGERIA: A FACT SHEET

OFFICIAL NAME: THE FEDERAL REPUBLIC OF NIGERIA

CAPITAL CITY: Abuja (Formerly Lagos)

GEOGRAPHY: Nigeria is one of the largest countries in Africa with an area of 356,669 square miles, roughly twice the size of California. It lies wholly within the tropics along the Gulf of Guinea, on the western coast of Africa. It is bounded on the west by the Republic of Benin, on the north by the Republic of Niger, and on the east by the Republic of Cameroun. Its climate varies from tropical at the coast to sub-tropical further inland. Temperature is generally very high and increases as one moves from the southern to the northern part of the country resulting in a wide geographical variety of physical features. There are two well marked seasons - the dry season (November - March) and the rainy season (April - October). Temperatures at the coast seldom rise above 84 F but humidity can be as high as 95%. The climate is drier further north where extremities of temperature are common, sometimes ranging from 98 F to 47 F.

POPULATION: 115,300,000 (The most populous country in Africa: one out of every 4 black Africans is a Nigerian).

RELIGIONS: Islam (predominantly in the North and the Southwest), Christianity (Protestant [mostly in the Southwest and Central region] and Catholic [predominantly in the Southeast]), and Traditional African religions.

MAJOR ETHNIC GROUPS: Hausa, Fulani, Ibo, Yoruba, Edo, Urhobo, Efik, Ijaw, Tiv, and Kanuri. There are over three hundred ethnic groups.

LANGUAGES: Hausa, Ibo, and Yoruba. English is the official language.

HISTORY: The precolonial states of Nigeria include the Hausa-Fulani states of the north, the Kanem Bornu states of the North-East, the Western monarchies of the Yorubas, the Benin Empire, and the gerontocracies of the Ibos. The precolonial history of Nigeria was essentially that of the migration and fusion of people and the rise and fall of states and empires. This period was subsequently followed by the slave trade with the Europeans and its replacement by trade in tropical produce. The establishment and expansion of British influence in both the Northern and Southern parts of Nigeria and the imposition of British colonial rule resulted in the amalgamation of the protectorates of Northern and Southern Nigeria in 1914.
1960 - October 1 - Nigeria became independent from British colonial rule.
1963 - Nigeria became a Republic - severing all links with the British Crown.
1966 - January 15, first military coup - General Aguyi-Ironsi, leader.
1966 - July 29, counter coup - Lt. Colonel Gowon - leader.
1967 - May 27 - Gowon created 12 states to replace the 4 regions.

1967 - May 30 - Former Eastern Region declared secession from the Federal Republic of Nigeria and declared their independent Republic of Biafra.
1967 - 1970 - Nigerian Civil War - Biafran side defeated and reincorporated into the Federal Republic of Nigeria.
1975 - July 29 - Military Coup - General Gowon toppled by General Mohammed.
1976 - the number of states increased from 12 to 19.
1976 - February 13 - General Mohammed assassinated in an abortive military coup. General Obasanjo took over as Head of State.
1979 - October 1 - General Obasanjo handed over power to the first democratically elected civilian president - Alhaji Shehu Shagari of the National Party of Nigeria.
1983 - December 31 - military coup - Shagari toppled and General Buhari took over as Head of State.
1985 - August 27 - military coup - General Babangida deposed the government of General Buhari.
1987 - two new states were created.
1991 - nine new states were created.
Political program for transferring power to democratically elected government set in motion.
1993 - General Babangida resigned as President and set up a transitional government under the leadership of Mr. Shonekan, a renowned Economist and businessman.
1993 - November - Transitional government toppled by General Abacha.

POLITICAL: Federal Republic. Thirty six states and the Federal Capital, Abuja. Three-tier government: Federal, State, and Local Government. According to the 1996 Constitution, the Federal Government has an executive arm headed by the President and Cabinet; a Bicameral Legislature: Senate and House of Representatives, and Federal Judiciary: Supreme Court, Federal Courts of Appeal, Federal High Courts. At the state level, there is Governor and Cabinet (Executive), a State House of Assembly (Legislature), and State Judiciary. At the Local Government level, there is a Council (Legislature) as well as an Executive branch headed by the Chairman, Secretary, and Heads of Department.
At present, the military controls power. There is a plan to return the country to democratic civilian rule soon after a general election. A new constitution has been written, and political parties have been formed. Local elections were held in 1997, and elections at state and federal levels will be held in 1998, culminating in presidential elections and eventual handover of power to a democratically elected government.

ECONOMY:
Agriculture: Oil seeds, cocoa, palm oil, timber, cattle, goats, cotton, peanuts, root crops, rubber, shea butter.
Minerals and Power: Oil, tin ores and concentrates, coal, columbite, natural gas, hydro-electricity.
Manufactures: Timber, oil seed crushing, textiles, handicrafts (metal working, leather dyeing, mats, etc.), meat canning, sugar refining, oil refining, furniture, steel, plastics, food processing,

building materials.
Principal export: Crude oil (World's eighth-largest producer of petroleum, third largest exporter of oil to the U.S.); accounts for nearly 90% of foreign revenues.

CURRENCY: NAIRA AND KOBO (100 Kobo = 1 Naira) $1 = N85.

EDUCATION: The Nigerian education system is going through tremendous changes. It has changed from a model that emphasized liberal education to a more practical-oriented 6-3-3-4 system of education relevant to national needs and objectives. Elementary education lasts 6 years, and the duration in the secondary system was changed from 5 years to 3 years in Junior Secondary School (Both academic and prevocational curriculum) and 3 years in Senior Secondary School (with the following tracks: secondary grammar, commercial, technical and vocational, and teacher training). Post-secondary education consists of universities (3, 4, 5, or 6 year degree programs, Certificate and Diploma programs, as well as graduate and doctoral programs in various fields); Polytechnics (2-year National Diploma and 2-year or 4-year Higher National Diploma); Advanced Teachers' Colleges/Colleges of Education (4-year Teacher Education degree programs and 3-year Nigerian Certificate in Education (NCE) programs) as well as other specialized institutions.
Primary (Elementary) education is the responsibility of Local Governments, while secondary and tertiary education is the concurrent responsibilities of the Federal and State Governments. Nigerian school children go to school six days a week and wear uniforms to school. Primary Education is free and compulsory. Secondary and higher educations are highly subsidized by the government.

NATIONAL PLEDGE

I pledge to Nigeria my country
To be faithful, loyal and honest
To serve Nigeria with all my strength
To defend her unity
And uphold her honor and glory
So help me God.

NATIONAL ANTHEM

Arise, O compatriots,
Nigeria's call obey
To serve our Fatherland
With love and strength and faith
The labour of our heroes past
Shall never be in vain
To serve with heart and might
One nation bound in freedom,
Peace and Unity.

Oh God of creation,
Direct our noble cause;
Guide our leaders right;
Help our youth the truth to know
In love and honesty to grow
And living just and true
Great lofty heights attain
To build a nation where peace
And justice reign.

Kano, Nigeria
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KABIRU'S FAMILY

Hello, my name is Kabiru. I live in the city of Kano, Nigeria. I would like to tell you something about my family and where I live. I am excited to tell you that my father bought a brand new car last year. I am very happy because the car has changed my life in many ways.

First of all, I am 11 years old and I am in class five. Next year, I will be in class six and I will take my Common Entrance Examination for entry into the Junior Secondary School. So I have to study hard. I play soccer and basketball. I enjoy reading, traveling, and making friends. I would like to become a teacher when I grow up.

I have a very large family. I have 15 brothers and sisters. We all live in the same house. So you can imagine how big our house is! I am the sixth child in my family. In addition to my father and mother, my grandparents live with us. They tell us stories at night. They give us candy and other small nice gifts. I love my grandparents!

We live in the city of Kano. It is the capital of Kano State. There are about 2 million people in Kano city and its suburbs. It is an ancient, beautiful city. We live in the ancient traditional part of the city, which is surrounded by walls and gates built over 600 years ago. Outside the walled city, you will find the modern city, with modern buildings, wide roads, parks, offices, factories, houses, and stores.

As I told you, my father bought a new car last year. It is a Peugeot 505 Station Wagon. It carries seven to eight people, so many of family members can ride the car at the same time. Before my father bought the car, we used to walk to school, to the market, and other places. Sometimes, we rode the bus or taxi if we were going to far away places. Sometimes, we take the train or the aeroplane to travel to other parts of Nigeria to visit relatives or go on vacation. There are many cars in Kano. However, you can still see people riding bicycles, motorcycles, horses, camels, and donkeys. I wonder why people still ride animals to move from one place to another or to carry goods around. And I am even more curious how people in the past traveled from one place to another. So I asked my teacher about the history of transportation in ancient Kano, before cars, planes, and trains were introduced. I did a project on the history of transportation in Kano, and this is a summary of what I found out in my research.

Before the invention of cars, people traveled on foot, carrying their loads on their heads, backs, or shoulders. This form of transportation is called human porterage. People traveled to markets or trading centers carrying their goods or crops. Human porterage is still a common means of carrying goods especially in areas where modern transport facilities, such as good roads and trucks, are not available or are too expensive for the majority of the people. But people can carry only a small number of goods and they can travel only short distances.

Not only goods were carried by human beings. Important people in society were also carried in special seats (sedan chairs or litters) which were supported on the shoulders of several people. In our society, some traditional rulers and (during the colonial days) the British district officers, were carried in this way. Carrying people on shoulders was not only practiced in Kano and other parts of Nigeria. Some Europeans, called the Romans, carried their important statesmen in special seats.

Within the city, goods were moved from one place to another by men pulling or pushing wooden carts with wheels attached to them. This was still inefficient as the carts filled with goods were heavy, and they could not be pushed very far.

Animals such as donkeys, mules, horses, oxen, and camels were used to transport goods and people. For example, donkeys were used by farmers to transport crops and sometimes the farmers themselves from the farm to the market. They were also used to transport water which was stored in leather pouches which were hung over the sides of the donkeys. The *Fulani* (an ethnic group) used their cattle to carry their personal goods as they moved about in search of pasture. The camel could travel long distances under difficult conditions and carrying heavy goods. This why it was used in the trans-Saharan trade between North Africa and Northern Nigeria. The horse has been used as a means of transportation, especially during wars when mounted soldiers formed cavalries. In some rural areas, horses are still used to carry people especially during the rainy season when the rivers overflow. On ceremonial occasions, traditional rulers from towns and villages ride on horseback to greet the Emir of Kano and show their loyalty to him. Horses are still a symbol of power. Their more modern use is as race horses and polo ponies.

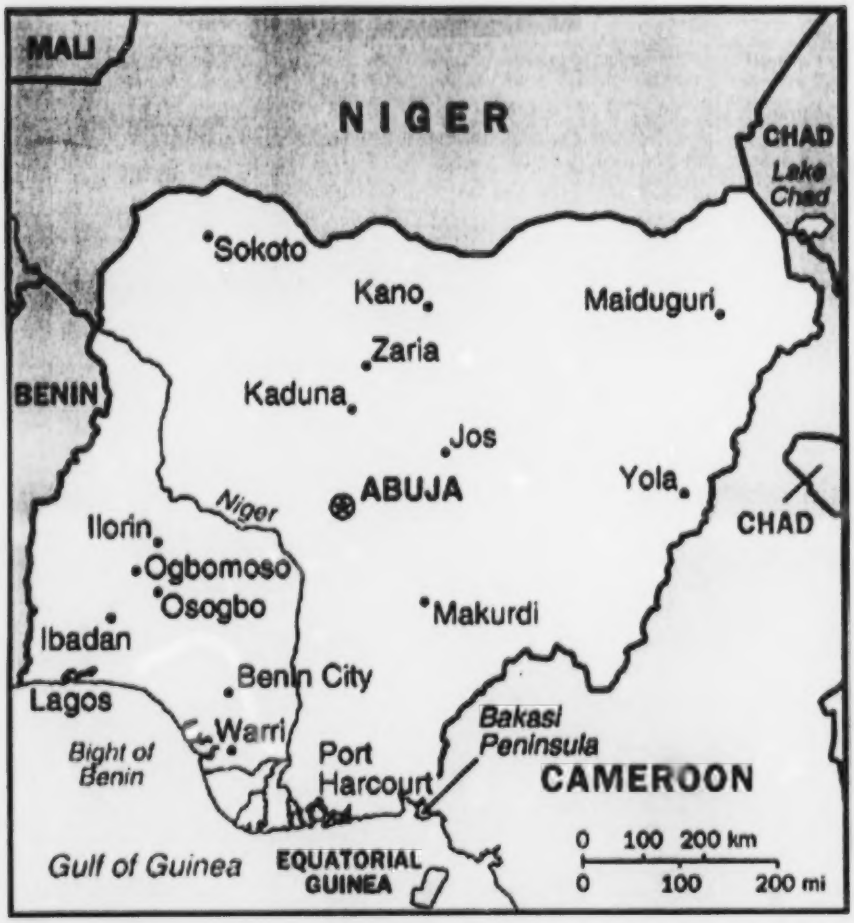
The introduction of the modern transportation in the form of cars and trucks was necessary for the British colonial rulers and European companies to rule Nigeria effectively and move goods and services more efficiently. These were the primary reasons why cars were introduced in Nigeria. So the British colonial administration began building roads in 1904, and vehicles drawn by donkeys or horses were introduced. Gradually, more and more roads were built and more and more cars were brought to Nigeria. At the same time, the colonial administration was developing rail, air, and water transportation as well.

Today, I am very happy to have a car in my family. We can now move around more quickly. The car has also made communication with our relatives who live in other places much easier. We get things that we need in the family such as groceries, faster. We can go the hospital much faster in case of an emergency. We also take more frequent vacations now than we used to. Generally, the car has improved our lives in many ways.

However, I am scared about frequent car accidents that happen on our roads. Many people die everyday because of careless driving by some drivers. We need to improve driver education to make people more aware of traffic rules, the importance of obeying traffic rules and regulations,

and careful driving on our roads.

I hope you have enjoyed my story about my family and how the car has changed our lives.



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